REMARKS

The proposed Amendments to the Specification have been provided to ensure correspondence between the Specification and the Formal Drawings filed herewith.

The Commissioner is hereby authorized to charge any fee deficiencies or credit any overpayments to Deposit Account 16-1340.

Respectfully submitted,

Dated: July 16, 2004

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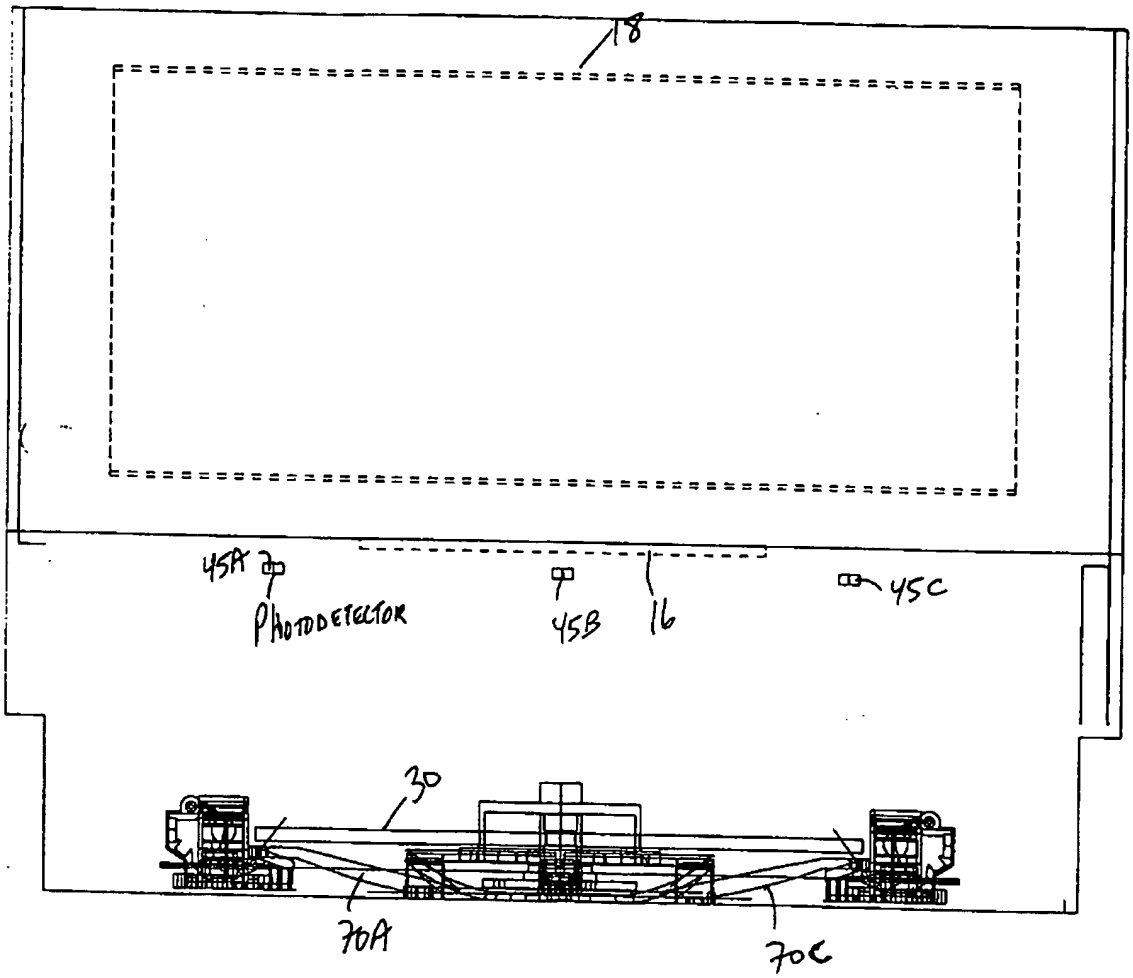

FIG. ~~2I~~
2I

*** Table of I	Dependent Parameters for both the Scanner and the Disk ***			DiskStr. 4a					
Box height (inches):				N/A	(See Note 1)	Problem items are			
Box width (inches):				N/A	(See Note 2)	highlighted (red).			
Max angle B (degrees):				62.00	(See Note 3)				
Min angle B (degrees):				38.00	(See Note 3)				
Total facet angular sweep (degrees):				358.14	(See Note 4)				
Min (angle A - angle B) (degrees):				0.00	(See Note 6)				
Max beam speed (inches per second):				13704					
Min beam speed (inches per second):				7158					
Power at data detector (nW):				872					
Signal voltage (volts):				5.47	(See Note 7)				
Signal voltage at max DOF limits (volts):				3.45	(See Note 7)	0.91	Max bandwidth (MHz) for	7.5	mil bars
CDRH:	P-avg. Class 2?	Class 2A?	P-pulse Class 1?						
	YES	YES	YES		(See Note 8)				
IEC:	Single pulse	P-avg. 0.25s	Pulse train correction						
	PASS	PASS	PASS		(See Note 8)				

Note 1: If this entry is highlighted (red) then the value exceeds the specified value for the box height (Cell G21). Go to cells G417 to G456 to identify the problem entries and make the necessary inner radius adjustments in Cells G215 to G254.

Note 2: This entry is not used in the box design, but it gives an indication of the box dimensions that would be established by the width of the tops of the mirrors.

Note 3: Generally, the B angles should range between 40 degrees and 70 degrees. Holograms with smaller or larger angles may be difficult to construct.

Note 4: This entry must be less than, but within a few degrees of, 360 degrees. To satisfy this requirement, it may be necessary to make adjustments to the focal distances and/or the length of the scan lines.

FIG. 3F

Note 6: This value must be greater than 0.5 degrees to avoid feedback into the laser from disk surface reflections. If it is too small, adjustments must be made to the B angles of the problem facets (See Cells X468 to X507).

Note 7: The signal voltage must be greater than some value established by the signal processor requirements. Typically, this value should be greater than 2 volts. If this value is less than 2 volts, either the laser power must be increased or the focal distances must be decreased.

Note 8: All CDRH/IEC entries must be YES or PASS. If not, laser power must be reduced. (Modify laser power in Cell B799.)

FIGS. 3F1 and 3F2

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d = distance from disk to base of scanner (inches):							0						
Rotational speed of disk (rpm)							5200						Maximum Collection
DiskStratos_4.xls							650 nm				Accounting for	Light	Area
	Diffraction	Geometrical				Focal plane	358.14				dead time for	Collection	(Ignoring
Facet	Focal length	Focal length	Angle A	Angle B	Angle of	scan line		Scan mult.	Rotation		laser beam	Factor	notch)
	(inches)	(inches)	(degrees)	(degrees)	Diffraction	length	Scan Angle	Factor (m)	Angle		1.15		
	Given		Given	Given	(degrees)	(inches)	(degrees)		(degrees)		(degrees)		(sq. in.)
1	12.5	12.73	52	38.00	52.00	9.750	42.61	1.62	26.24		27.39	1.00	2.28
2	11.5	11.68	52	40.00	50.00	9.750	45.95	1.62	28.35		29.50	0.60	1.81
3	12.7	12.94	52	42.00	48.00	9.750	42.00	1.58	28.66		27.81	0.92	2.09
4	11.5	11.68	52	44.00	46.00	9.750	45.95	1.57	29.19		30.34	0.71	1.62
5	12.7	12.94	52	48.00	42.00	9.750	42.00	1.50	27.97		29.12	0.79	1.79
6	12.0	12.21	52	52.00	38.00	9.750	44.22	1.46	30.28		31.43	0.64	1.47
7	14.7	15.08	52	58.00	32.00	9.750	36.69	1.31	27.99		29.14	0.87	1.97
8	14.7	15.08	52	58.00	32.00	9.750	36.69	1.31	27.99		29.14	0.87	1.97
9	13.5	13.80	52	60.00	30.00	9.750	39.71	1.30	30.65		31.80	0.71	1.61
10	13.5	13.80	52	60.00	30.00	9.750	39.71	1.30	30.65		31.80	0.71	1.61
11	14.8	15.19	52	62.00	28.00	9.750	38.46	1.25	29.19		30.34	0.83	1.88
12	14.8	15.19	52	62.00	28.00	9.750	38.46	1.25	29.19		30.34	0.83	1.88

~~FIG. 3G1~~ FIGS 3G1A and 3G1B

D .atc.

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Notch size in mirror																
TG (12/21/99)																
3.5 mm x 5.1 m	(3.5 mm x 6.5 mm at disk)															
Design																
Collection																
Area	Beam speed	Beam speed	Beam speed	Beam												
(Includes	at center of	at max depth	at min depth	skew	Facet count											
notch loss of	scan line	of field	of field	angle	function	Number of										
0.035					1 = facet	facets										
sq. inches)	(inches/sec)	(inches/sec)	(inches/sec)	(degrees)	0 =no facet	12										
						Max freq.	Min Freq.	Bandwidth								
1	2.27	11052	13704	8400	0	1	0.914	0.560	0.354							
2	1.81	10150	12798	7502	0	1	0.853	0.500	0.353							
3	2.08	10895	13468	8321	0	1	0.898	0.555	0.343							
4	1.63	9858	12429	7286	0	1	0.829	0.486	0.343							
5	1.79	10383	12835	7930	0	1	0.856	0.529	0.327							
6	1.47	9544	11929	7158	0	1	0.795	0.477	0.318							
7	1.97	10492	12634	8351	28	1	0.842	0.557	0.286							
8	1.97	10492	12634	8351	-28	1	0.842	0.557	0.286							
9	1.62	9524	11640	7407	28	1	0.776	0.494	0.282							
10	1.62	9524	11640	7407	-28	1	0.776	0.494	0.282							
11	1.88	10068	12108	8027	28	1	0.807	0.535	0.272							
12	1.88	10068	12108	8027	-28	1	0.807	0.535	0.272							

NOTE: If any entry in these two columns is less than 0.5 degrees (highlighted in red), the corresponding B angle should be changed. This is accomplished by modifying the "Distance from rotational axis" entry for that line (cells G46 to G85).

Angle A - Angle B (Absolute value) (degrees)
14.00
12.00
10.00
8.00
4.00
0.00
6.00
6.00
8.00
8.00
10.00
10.00

FIG. 3G2

FIGS. 3G2A and 3G2B

DiskStr

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Avg. f.l. (in.) 13.82 | Average angle B (degrees): 52.00 | SUMS ---> | Average: 480.46 | 1.42 | 344.36 | 358.14 | 9.88 | 21.99 | 21.99 | <---SUMS

Avg waist loc 13.34 | Maximum angle B (degrees): 62.00

Approximate minimum box width: N/A Inches

(Based on large mirror as limitation)

Total facet angular sweep (degrees): 388.14

Vmax (in/s): 13704

Vmin (in/s): 7158

Ratio 1.91

--- Master Hologram Exposure Information ---

DiskStrates_4.xls

Gelatin Refractive Indexes | Wavelengths (microns)

Before processing: 1.53 | Scanner: 0.66 | 660 nm

After processing: 1.4 | Exposure: 0.488

Distance from beam incidence point on disk to 488 nm reference point: 0 inch

Grating spacing at scan region (microns)

Design wavelength = 0.66 microns

Facet	Grating spacing at scan region (microns)	Facet	Diffraction angle from annulus (degrees)	Diffraction angle from reference point (degrees)	Exposure angles at reference point at 488 nm: Reference Beam (degrees)	Object Beam (degrees)	alpha-1 (degrees)	beta-1 (degrees)	phi (degrees)	theta-1 (degrees)	L (microns)	theta-2 (degrees)	alpha-2 (degrees)	beta-2 (degrees)
1	0.4631	1	52.00	52.00	25.13	38.99	26.06	34.25	86.92	30.17	0.46	20.20	16.12	24.28
2	0.4704	2	50.00	50.00	25.45	37.42	26.06	33.17	86.46	29.53	0.47	19.86	16.31	23.40
3	0.4784	3	48.00	48.00	25.76	35.82	26.06	32.06	87.01	29.07	0.48	19.50	16.52	22.49
4	0.4969	4	46.00	46.00	26.12	34.20	26.06	30.92	87.56	28.50	0.49	19.14	16.73	21.55
5	0.5059	5	42.00	42.00	26.81	30.90	26.06	28.65	88.77	27.33	0.51	18.38	17.18	19.61
6	0.5378	6	38.00	38.00	27.63	27.63	26.06	26.09	90.00	26.06	0.53	17.58	17.58	17.58
7	0.5674	7	33.00	32.00	28.64	22.38	26.06	22.24	91.82	24.17	0.57	16.33	18.26	14.41
8	0.5674	8	31.00	32.00	28.64	22.38	26.06	22.24	91.82	24.17	0.57	16.33	18.26	14.41
9	0.5838	9	30.00	30.00	29.02	20.64	26.06	20.82	92.58	23.51	0.58	15.90	18.48	13.32
10	0.5838	10	30.00	30.00	29.03	20.64	26.06	20.82	92.58	23.51	0.58	15.90	18.48	13.32
11	0.5990	11	29.00	29.00	29.40	19.89	26.06	19.59	93.25	22.84	0.60	15.47	18.71	12.27
12	0.5990	12	29.00	29.00	29.40	19.86	26.06	19.59	93.25	22.84	0.60	15.47	18.71	12.22

~~FIG. 3H~~

FIGS. 3H1 through 3H3

*** Modified Exposure Angles to Correct for Post-processing Residual Gelatin Swell ***															
DiskStratos_4.xls							650 nm								
Percent gelatin swell (from measurements) delta-t/t:				20%											
	Exposure angles at 488 nm			Exposure angles to compensate for swell											
	Reference	Object		Reference	Object		gamma(sw)	gamma(0)	A	B	C	Z	alpha-0	beta-0	
Facet	Beam	Beam		Beam	Beam										
	(degrees)	(degrees)		(degrees)	(degrees)										
1	25.13	38.99		23.85	40.50		-4.08	-4.90	1.99	0.17	0.69	0.26	15.33	25.12	
2	25.45	37.42		24.34	38.70		-3.54	-4.25	1.99	0.15	0.68	0.27	15.62	24.12	
3	25.78	35.82		24.83	36.88		-2.99	-3.58	1.99	0.12	0.67	0.27	15.93	23.10	
4	26.12	34.20		25.35	35.04		-2.41	-2.90	1.99	0.10	0.66	0.28	16.25	22.04	
5	26.81	30.90		26.41	31.31		-1.23	-1.48	2.00	0.05	0.63	0.29	16.90	19.86	
6	27.53	27.53		27.53	27.53		0.00	0.00	2.00	0.00	0.60	0.30	17.58	17.58	
7	28.64	22.38		29.28	21.77		1.92	2.31	2.00	-0.08	0.56	0.32	18.65	14.03	
8	28.64	22.38		29.28	21.77		1.92	2.31	2.00	-0.08	0.56	0.32	18.65	14.03	
9	29.02	20.64		29.89	19.83		2.58	3.10	1.99	-0.11	0.55	0.33	19.01	12.81	
10	29.02	20.64		29.89	19.83		2.58	3.10	1.99	-0.11	0.55	0.33	19.01	12.81	
11	29.40	18.89		30.50	17.89		3.25	3.90	1.99	-0.14	0.53	0.33	19.37	11.58	
12	29.40	18.89		30.50	17.89		3.25	3.90	1.99	-0.14	0.53	0.33	19.37	11.58	

~~FIG. 3I~~

FIGS. 3I1 and 3I2

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*** Analysis of the Focus Shift and Out-of-focus Spot Size for Converging Reference Beam ***													
(Not applicable for Stratos)													
Convergence of the reference beam:				-1477	mm								
Focal length of parabolic mirror:				58.82	mm								
Distance from parabolic mirror to detector:				60	mm								
	Design	Par. Mirror	Required	Object	Image	Image	Spot size						
Facet	Focal length (mm)	Eff. width (mm)	foc. length (mm)	distance (mm)	distance (mm)	shift (mm)	at detector (mm)						
								0.88					
1	317.50	40	404.42	-14858.75	59.05	-0.95	0.64	Distance (Cell E621) may have to be adjusted					
2	292.10	40	364.09	31841.43	58.71	-1.29	0.88	so that the maximum spot size at the detector is					
3	322.58	40	412.69	-11828.19	59.11	-0.89	0.60	approximately the same when the 1/2 depth of field value					
4	292.10	40	364.09	31841.43	58.71	-1.29	0.88	is negative as it is when the 1/2 depth of field value is positive.					
5	322.58	40	412.69	-11828.19	59.11	-0.89	0.60	(The 1/2 depth of field value is located at Cell G19)					
6	304.80	40	384.03	-48230.76	58.89	-1.11	0.75						
7	373.38	40	499.67	-4485.04	59.60	-0.40	0.27						
8	373.38	40	499.67	-4485.04	59.60	-0.40	0.27						
9	342.90	40	446.55	-6818.26	59.33	-0.67	0.45						
10	342.90	40	446.55	-6818.26	59.33	-0.67	0.45						
11	375.92	40	504.23	-4375.15	59.62	-0.38	0.25						
12	375.92	40	504.23	-4375.15	59.62	-0.38	0.25						

~~FIG. 3J~~

FIGS. 3J1 and 3J2

*** CDRH/IEC Calculations to Verify that the Scanner Meets the Laser Class Requirements ***							
The number of overlapping lines (N-overlap) must be determined from the scanner data.							
A safe assumption for our scanners is to consider that two scan lines are overlapped							
ONLY when the difference between their diffraction angles (B) is less than 2 degrees.							
All else being equal, the slowest scan lines (largest angle B) will be the worst case scan lines.							
N-overlap:	1						
Motor speed (rpm):			5200				
Alpha-min (radians):			0.0015	(from standard)			
FWHM P-divergence of laser (deg.):			8	(Linked from Trnc spreadsheet)			
FWHM S-divergence of laser (deg.):			30	(Linked from Trnc spreadsheet)			
Focal length of collimating lens (mm):			6.1	(Linked from Trnc spreadsheet)			
Angle of incidence at MF plate (deg.):			29.23				
Angle of diffraction at MF plate (deg.):			42.12				
X-p (mm):			0.87				
X-s (mm):			3.93				
Average source dimension (mm):			2.40				
Distance to aperture (mm):			200	(actual distance or 200 mm, whichever is greater)			
Alpha (radians):			0.012				
C6:			7.996				
	Laser power	tc (200)	tl (actual)				
	at window	7 mm transit	7 mm transit	P x tl			
Facet	(mW)	time at	time at	(Joules)			
		d = 200 mm	actual d				
		(seconds)	(seconds)			Facet count	
1	0.86	3.95856E-05	3.95856E-05	0.0000339		1	
2	0.86	3.96549E-05	3.96549E-05	0.0000341		1	
3	0.86	4.08001E-05	4.08001E-05	0.0000351		1	
4	0.86	4.08315E-05	4.08315E-05	0.0000352		1	
5	0.86	4.28115E-05	4.28115E-05	0.0000370		1	
6	0.87	4.40086E-05	4.40086E-05	0.0000381		1	
7	0.87	4.90358E-05	4.90358E-05	0.0000425		1	
8	0.87	4.90358E-05	4.90358E-05	0.0000425		1	
9	0.87	4.96126E-05	4.96126E-05	0.0000430		1	
10	0.87	4.96126E-05	4.96126E-05	0.0000430		1	
11	0.87	5.14525E-05	5.14525E-05	0.0000446		1	
12	0.87	5.14525E-05	5.14525E-05	0.0000446		1	

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FIG. 3L1

FIGS. 3L1A and 3L1B

Sums:		0.0000 DiskStr.	0.0000446 48	These values are the sums of the worst case (largest) overlap values		
Duty Cycle:	0.004459213					
Paverage is the sum of the overlap Pi x ti products divided by the sum of the ti times times the duty cycle Paverage is, therefore, the sum of the overlap Pi x ti products times the rps of the motor.						
CDRH calculations and results						
		Class 1	Class 2?	Class 2A?		
Pavg. (mW):	0.003869		YES	YES		
P (single pulse) (mW): (Maximum allowed)	8.27					
P (single pulse) (Actual)	0.87	YES				
IEC calculations and results						
IEC condition A (Single pulse)				PASS/FAIL		
P (single pulse) (mW): (Maximum allowed)	70.6			PASS		
IEC condition B (average power in a 0.25 second pulse train)						
Pavg. allowed (mW):	7.92			PASS/FAIL		
Pavg. scanner (mW):	0.0039			PASS		
IEC condition C (pulse train correction factor) (For this calculation, you need to insert the sum of the pulse times in the overlapping scan lines)						
T-total (seconds): (sum of pulse times in overlap scan lines)	0.000051					
Pmax (mW):	66.1					
Number of pulses in train:	21.67					
Correction factor:	0.4635					
Pmax (PT corrected)(mW):	30.63			PASS/FAIL		
Pw (including overlap)	0.87			PASS		

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FIG. 3L2

FIGS. 3L2A and 3L2B

	N	O	P	Q	R	S	T	U	V	W	X
46	Facet	1									
47	x	y	z								
48	-0.616	0.000	0.788								
49	End				Middle				End		
50	x	y	z		x	y	z		x	y	z
51	0.788	0.000	0.616		0.788	0.000	0.616		0.741	-0.367	0.562
52	-0.140	0.000	-0.990		-0.140	0.000	-0.990		-0.117	-0.367	-0.923
53	-0.595	0.448	0.667		-0.595	0.448	0.667		-0.590	0.098	0.801
54											
55											
56	Mirror 1 Corners				Mirror 2 Corners				Mirror 3 Corners		
57	x	y	z		x	y	z		x	y	z
58	3.750	-1.600	2.509		3.000	0.000	-0.112				
59	5.100	-2.400	1.728		4.800	0.000	0.382				
60	5.100	2.400	1.728		5.071	-2.256	1.066				
61	3.750	1.600	2.509		5.071	-2.256	1.066				
62					3.060	-1.000	0.175				
63											
64											
65											
66											
67											
68											
69	This station uses a split mirror for mirror #2. The second part of mirror 2 is the abo										
70											
71					3.000	0.000	-0.112				
72					4.800	0.000	0.382				
73					5.071	2.256	1.066				
74					5.071	2.256	1.066				
75					3.060	1.000	0.175				
76											

FIG. 6D2

~~Station 2~~

	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ
46	Facet	2									
47	x	y	z								
48	-0.616	0.000	0.788								
49	End				Middle				End		
50	x	y	z		x	y	z		x	y	z
51	0.766	0.000	0.643		0.766	0.000	0.643		0.711	-0.395	0.581
52	-0.175	0.000	-0.985		-0.175	0.000	-0.985		-0.149	-0.395	-0.907
53	-0.623	0.440	0.647		-0.623	0.440	0.647		-0.614	0.062	0.787
54											
55											
56	Mirror 1 Corners				Mirror 2 Corners				Mirror 3 Corners		
57	x	y	z		x	y	z		x	y	z
58	3.750	-1.600	2.509		3.000	0.000	-0.112				
59	5.100	-2.400	1.728		4.800	0.000	0.382				
60	5.100	2.400	1.728		5.071	-2.256	1.066				
61	3.750	1.600	2.509		5.071	-2.256	1.066				
62					3.060	-1.000	0.175				
63											
64											
65											
66											
67											
68											
69	This station uses a split mirror for mirror #2. The second part of mirror 2 is the abo										
70											
71					3.000	0.000	-0.112				
72					4.800	0.000	0.382				
73					5.071	2.256	1.066				
74					5.071	2.256	1.066				
75					3.060	1.000	0.175				
76											

FIG. 6D3

~~Station 2~~

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	A	B	C	D	E	F	G	H	I	J	K	L
46	Low Elevation	Facet	3									
47		x	y	z								
48	Vector from Module	-0.616	0.000	0.788								
49		End				Middle				End		
50		x	y	z		x	y	z		x	y	z
51	Output Vectors From Disk	0.743	0.000	0.669		0.743	0.000	0.669		0.697	-0.362	0.619
52	First Mirror Reflected Directions	-0.209	0.000	-0.978		-0.209	0.000	-0.978		-0.189	-0.362	-0.913
53	Second Mirror Reflected Directions	-0.649	0.433	0.625		-0.649	0.433	0.625		-0.648	0.089	0.757
54	Third Mirror Reflected Directions											
55												
56		Mirror 1 Corners				Mirror 2 Corners				Mirror 3 Corners		
57		x	y	z		x	y	z		x	y	z
58	1	3.750	-1.600	2.509		3.000	0.000	-0.112				
59	2	5.100	-2.400	1.728		4.800	0.000	0.382				
60	3	5.100	2.400	1.728		5.071	-2.256	1.066				
61	4	3.750	1.600	2.509		5.071	-2.256	1.066				
62	5					3.060	-1.000	0.175				
63	6											
64	7											
65	8											
66												
67												
68												
69	**Note: Special Case!**	This station uses a split mirror for mirror #2. The second part of mirror 2 is the abo										
70												
71	**Second Part of Mirror 2**					3.000	0.000	-0.112				
72						4.800	0.000	0.382				
73						5.071	2.256	1.066				
74						5.071	2.256	1.066				
75						3.060	1.000	0.175				
76												
77												

FIG. 6D4

~~Station 2~~

	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV
46	Facet	4									
47	x	y	z								
48	-0.616	0.000	0.788								
49	End				Middle				End		
50	x	y	z		x	y	z		x	y	z
51	0.719	0.000	0.695		0.719	0.000	0.695		0.664	-0.395	0.635
52	-0.243	0.000	-0.970		-0.243	0.000	-0.970		-0.220	-0.395	-0.892
53	-0.675	0.425	0.603		-0.675	0.425	0.603		-0.668	0.046	0.742
54											
55											
56	Mirror 1 Corners				Mirror 2 Corners				Mirror 3 Corners		
57	x	y	z		x	y	z		x	y	z
58	3.750	-1.600	2.509		3.000	0.000	-0.112				
59	5.100	-2.400	1.728		4.800	0.000	0.382				
60	5.100	2.400	1.728		5.071	-2.256	1.066				
61	3.750	1.600	2.509		5.071	-2.256	1.066				
62					3.060	-1.000	0.175				
63											
64											
65											
66											
67											
68											
69	This station uses a split mirror for mirror #2. The second part of mirror 2 is the abo										
70											
71					3.000	0.000	-0.112				
72					4.800	0.000	0.382				
73					5.071	2.256	1.066				
74					5.071	2.256	1.066				
75					3.060	1.000	0.175				
76											

FIG. 605

~~Station 2~~

	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH
46	Facet	5									
47	x	y	z								
48	-0.616	0.000	0.788								
49	End				Middle				End		
50	x	y	z		x	y	z		x	y	z
51	0.669	0.000	0.743		0.669	0.000	0.743		0.634	-0.311	0.708
52	-0.310	0.000	-0.951		-0.310	0.000	-0.951		-0.298	-0.311	-0.903
53	-0.724	0.407	0.557		-0.724	0.407	0.557		-0.730	0.114	0.673
54											
55											
56	Mirror 1 Corners				Mirror 2 Corners				Mirror 3 Corners		
57	x	y	z		x	y	z		x	y	z
58	3.750	-1.600	2.509		3.000	0.000	-0.112				
59	5.100	-2.400	1.728		4.800	0.000	0.382				
60	5.100	2.400	1.728		5.071	-2.256	1.066				
61	3.750	1.600	2.509		5.071	-2.256	1.066				
62					3.060	-1.000	0.175				
63											
64											
65											
66											
67											
68											
69	This station uses a split mirror for mirror #2. The second part of mirror 2 is the abo										
70											
71					3.000	0.000	-0.112				
72					4.800	0.000	0.382				
73					5.071	2.256	1.066				
74					5.071	2.256	1.066				
75					3.060	1.000	0.175				
76											

FIG. 6D6

~~Station 2~~

	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV	BW	BX
46	Facet	6													
47	x	y	z												
48	-0.616	0.000	0.788												
49	End				Middle				End						
50	x	y	z		x	y	z		x	y	z				
51	0.616	0.000	0.788		0.616	0.000	0.788		0.596	-0.232	0.769				
52	-0.376	0.000	-0.927		-0.376	0.000	-0.927		-0.369	-0.232	-0.900				
53	-0.770	0.387	0.508		-0.770	0.387	0.508		-0.781	0.173	0.600				
54															
55															
56	Mirror 1 Corners				Mirror 2 Corners				Mirror 3 Corners						
57	x	y	z		x	y	z		x	y	z				
58	3.750	-1.600	2.509		3.000	0.000	-0.112								
59	5.100	-2.400	1.728		4.800	0.000	0.382								
60	5.100	2.400	1.728		5.071	-2.256	1.066								
61	3.750	1.600	2.509		5.071	-2.256	1.066								
62					3.060	-1.000	0.175								
63															
64															
65															
66															
67															
68															
69	This station uses a split mirror for mirror #2. The second part of mirror 2 is the above mirrored about the y axis. I.e.:														
70															
71					3.000	0.000	-0.112								
72					4.800	0.000	0.382								
73					5.071	2.256	1.066								
74					5.071	2.256	1.066								
75					3.060	1.000	0.175								
76															

FIG. 607

~~Station 2~~

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— Optical Power at the Data Detector and Resulting Signal Levels —																														
Calculation of the power at the data detector for targets located at the focal planes and targets located at the maximum depth of field limits for each band.																														
Assumes average angular offset of:					0.7	degrees																								
(Offset of outgoing beam from center of facet)																														
																					Detector sensitivity (mV/mW):		6.27							
										(At focal plane)	(At maximum depth of field)										(Targets located at the focal focal planes)		(Targets located at the depth of field limits)						(From facet plane)	(From maximum depth of field)
Facet	Laser Power (mW)	Transm. of collimating lens	Refl. of fold mirror	Diff. Eff. of SHF plate	S - diff. refl. of holographic facet	S - refl. of second, third & fourth mirror	Transm. of Window	(At focal plane) Lambertian reflectance factor	(At maximum depth of field) Lambertian reflectance factor	Diffuse Refl. of bar code	Average of S and S - refl. of second, third & fourth mirror	Average of P and S - diff. eff. of holographic facet	Refl. of parabolic mirror	Transm. of hot, beam splitter	Transm. of polarizing filter (none used)	Power at window (mW)	Power at detector (nW)	Detector signal (Volts)	Power at detector (nW)	Detector signal (Volts)	Facet Collection Area (sq. in.)	Diffraction Angle bore Center of Facet (degrees)	Effective Radius of Collection Area (inches)	Light Refl. Collection Angle (degrees)	Light Refl. Collection Angle (degrees)
	0.98	0.98	0.98	0.85		0.97	0.9			0.9	0.96		0.93	0.93	1											
1		(This includes the truncation losses)			0.99			0.0027736	0.0018056			0.89				0.98	872	5.47	867	3.56	2.25	52.79	0.94	3.02	2.44
2					0.98			0.0027376	0.0017179			0.78				0.98	873	5.47	949	3.43	1.79	50.79	0.90	2.99	2.38
3					0.98			0.0026941	0.0017879			0.71				0.98	874	5.48	873	3.56	2.07	48.79	0.91	2.97	2.60
4					0.98			0.0026424	0.0018637			0.72				0.98	874	5.48	861	3.43	1.81	46.79	0.93	2.96	2.34
5					0.98			0.0025857	0.0016804			0.79				0.98	876	5.49	874	3.50	1.77	42.79	0.94	2.90	2.35
6					0.98			0.0024980	0.0016002			0.77				0.97	877	5.50	863	3.53	1.45	38.79	0.96	2.86	2.29
7					0.98			0.0024123	0.0016460			0.78				0.97	878	5.51	807	3.50	1.99	32.79	0.72	2.83	2.34
8					0.98			0.0024122	0.0015609			0.79				0.97	879	5.51	807	3.50	1.95	32.79	0.73	2.83	2.34
9					0.98			0.0023474	0.0015995			0.80				0.97	880	5.51	809	3.98	1.56	30.79	0.66	2.80	2.29
10					0.98			0.0023474	0.0015995			0.80				0.97	880	5.51	809	3.98	1.56	30.79	0.66	2.80	2.29
11					0.98			0.0023646	0.0016356			0.81				0.97	880	5.52	808	3.62	1.98	28.79	0.72	2.79	2.32
12					0.98			0.0023646	0.0016356			0.81				0.97	880	5.52	808	3.62	1.98	28.79	0.72	2.79	2.32

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FIG. 9 FIGS. 9A through 9C

TRNCStratos-S-Pol.xls

Degrees to radians conversion factor: 0.017453293

Truncation analysis. Effect of truncation on the diffraction limited spot size of a Gaussian beam

Given the laser and lens parameters, this spreadsheet will calculate the effect of truncation on the beam. The final result is an "effective diameter." This is an equivalent 1/e-squared diameter that will produce the same spot size at the focal point as the actual truncated beam. This is also the beam diameter that will be inserted in the main scanner disk design spreadsheet.
The actual number linked to the main spreadsheet will be a rounded number.
It will usually be rounded up 0.1 to allow for tolerances.

Sony SLD1137VS

Wavelength (nm): 650
theta-P (degrees): 8
theta-S (degrees): 30
Astigmatism (microns): 7

H = Hoya; K = Kodak; P = Philips; O = GelTech
(Alternate choices - from Tom's table)

Lens:		G/350430		K/A397	H/A41	K/77	P/AC052	P/AC325	P/AC320	H/A129	P/???	H/A62	H/AH11	P/AC355	H/A51	H/A123	K/A370	G/350350	G/350430
	focal length (mm)	5		11	10	9.5	9	8	7.5	7	7	6.67	6.25	6.25	6	5.4	4.6	6.1	5
	Numerical Aperture	0.15		0.3	0.33	0.3	0.3	0.3	0.3	0.39	0.3	0.33	0.4	0.35	0.4	0.36	0.3	0.16	0.15
	Clear Aperture (mm)	1.50	lens diam	7.2	8	8.05	6.5	6.5	6.4	8.3	5.8	6.58	6.5	6.37	5	8.05	2.8	2	
	(= 2 x f x NA)		dbeam-all	4.8	4.7	4.1	3.9	3.5	3.3	3.7	3.1	3.2	3.4	3.1	3.3	2.9	2.1	1.7	1.2

1/e-squared beam diameter at lens (mm): 1.188

Aperture factor (m): 1.263

m = 1 is 1/e-squared truncation
m > 2 is essentially no truncation

1/e-squared beam radius (for normalized aperture): 0.792

Truncation factor: 1.219

1/e-squared radius at focal plane is increased by this factor due to truncation.

Z0: 3.078
(A(Z0)/A(0))^2 = 0.1353353
Ln((A(Z0)/A(0))^2) = -2.000000001

To determine the effective diameter, vary Z0 until (A(Z0)/A(0))^2 = 0.1353353 or, equivalently, until Ln((A(Z0)/A(0))^2)=-2
This can most easily be done by using the SOLVER function of Excel Tools:
Target cell = C31; Value = -2
Change cell = C29

Effective diameter: 0.97

Spreadsheet value: 1.10

This is the effective beam diameter that is linked to the Gaus spreadsheet and the main disk design spreadsheet.

The remaining part of this spreadsheet is simply the numerical integration of the diffraction equation for A(z) from the Mathcad program.
It includes the evaluation of the functions (A(Z)/A(0))^2 and Ln((A(Z)/A(0))^2).
It also includes a graph of (A(Z)/A(0))^2 vs Z.

			Zn =	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	1.1	1.2	1.3	1.4
			delta-Z =	0.1																
delta-r	r	e^-(r/r0)^2		A(Z1)	A(Z2)	A(Z3)	etc.													
0.01	0	1		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0.01	0.9996405		9.99841E-05	1E-04	1E-04	1E-04	1E-04	1E-04	1E-04	1E-04	1E-04	1E-04	1E-04	1E-04	1E-04	1E-04	1E-04	1E-04	1E-04
	0.02	0.9993623		0.000199872	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
	0.03	0.9988656		0.00029957	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.000299	0.000299	0.000299	0.000299
	0.04	0.9974517		0.000398981	0.000399	0.000399	0.000399	0.000399	0.000399	0.000399	0.000399	0.000399	0.000399	0.000399	0.000399	0.000399	0.000399	0.000399	0.000399	0.000399
	0.05	0.9950211		0.000498011	0.000498	0.000498	0.000498	0.000498	0.000498	0.000498	0.000498	0.000498	0.000498	0.000498	0.000498	0.000498	0.000498	0.000498	0.000497	0.000497
	0.06	0.9942754		0.000596565	0.000597	0.000597	0.000597	0.000596	0.000596	0.000596	0.000596	0.000596	0.000596	0.000596	0.000596	0.000596	0.000596	0.000596	0.000596	0.000596
	0.07	0.9922162		0.000694551	0.000695	0.000695	0.000694	0.000694	0.000694	0.000694	0.000694	0.000694	0.000694	0.000694	0.000694	0.000694	0.000694	0.000693	0.000693	0.000693
	0.08	0.9898456		0.000791876	0.000792	0.000792	0.000792	0.000792	0.000792	0.000791	0.000791	0.000791	0.000791	0.000791	0.00079	0.00079	0.00079	0.00078	0.000789	0.000789
	0.09	0.9871657		0.000888449	0.000888	0.000888	0.000888	0.000888	0.000888	0.000888	0.000888	0.000888	0.000887	0.000887	0.000887	0.000886	0.000886	0.000885	0.000885	0.000885
	0.1	0.9841791		0.000984179	0.000984	0.000984	0.000984	0.000984	0.000984	0.000983	0.000983	0.000983	0.000982	0.000982	0.000981	0.000981	0.00098	0.000979		
	0.11	0.9808848		0.001078977	0.001079	0.001079	0.001079	0.001078	0.001078	0.001078	0.001078	0.001077	0.001077	0.001076	0.001076	0.001075	0.001074	0.001073	0.001073	
	0.12	0.9772974		0.001172757	0.001173	0.001173	0.001172	0.001172	0.001172	0.001171	0.001171	0.00117	0.001169	0.001168	0.001168	0.001167	0.001166	0.001164		
	0.13	0.9734088		0.001265431	0.001265	0.001265	0.001265	0.001265	0.001264	0.001264	0.001263	0.001262	0.001261	0.00126	0.001259	0.001258	0.001256	0.001255		
	0.14	0.9692265		0.001356917	0.001357	0.001357	0.001356	0.001356	0.001355	0.001355	0.001354	0.001353	0.001352	0.00135	0.001349	0.001347	0.001346	0.001344		

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~~FIG. 11A1~~

FIGS. 11A1A through 11A1H

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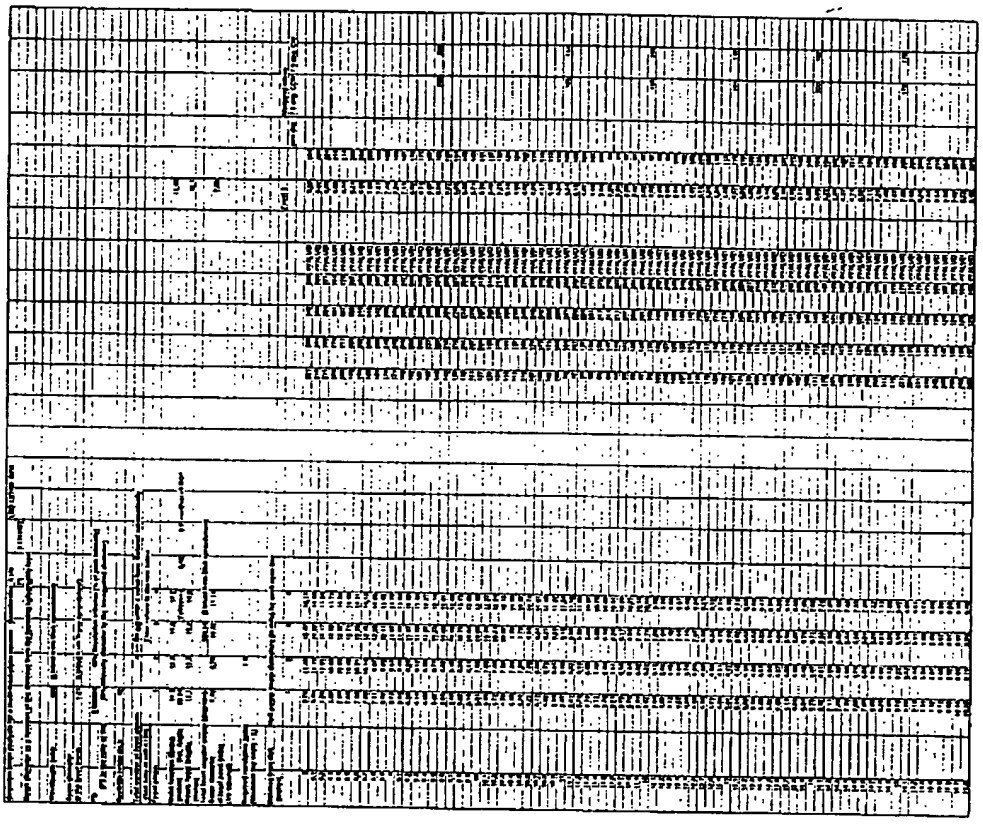

FIGS. 11B1A through 11B1H

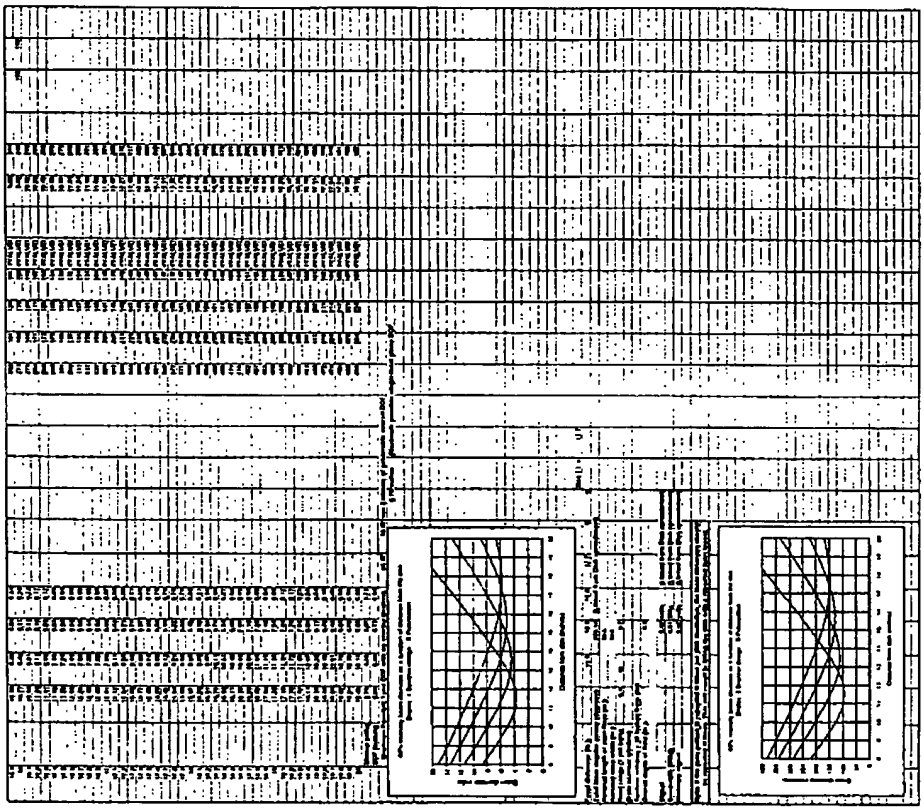

FIG. 11B2

FIGS. 11B2A through 11B2E

	A	B	C	D	E	F	G	H	I	J	K	L	M
106		Facet			Facet			Facet			Facet		
107	G3	1			2			3			4		
108	Point 1	5.11617	1.95380	1.89155	5.01400	1.88093	1.96715	4.92433	1.81870	2.03365	4.82799	1.75935	2.10576
109	Point 2	4.98460	1.86904	1.98969	4.88136	1.79109	2.06571	4.77964	1.72980	2.14196	4.68407	1.66502	2.21298
110	Point 3	4.94695	2.08109	2.03847	4.88064	1.79549	2.06667	4.75362	1.86942	2.17507	4.68407	1.66502	2.21298
111	Point 4	4.55990	1.69707	2.31542	4.46955	1.51422	2.37191	4.31720	1.51260	2.49402	4.34215	1.44090	2.46771
112	Point 5	4.35785	-1.63559	2.18575	4.29296	-1.52325	2.24765	4.14486	-1.55897	2.36336	4.17995	-1.53887	2.33696
113	Point 6	4.71038	-2.01784	1.86940	4.68022	-1.80322	1.91239	4.54753	-1.91413	2.00915	4.50146	-1.76326	2.05933
114	Point 7	4.77395	-1.80620	1.83693	4.68147	-1.79883	1.91177	4.59009	-1.77513	1.98718	4.50146	-1.76326	2.05933
115	Point 8	4.89971	-1.89063	1.72862	4.80732	-1.88882	1.80291	4.72764	-1.86391	1.86903	4.63750	-1.85821	1.94186
116	Point 9	5.11617	1.95380	1.89155	5.01400	1.88093	1.96715	4.92433	1.81870	2.03365	4.82799	1.75935	2.10576
117	Start of scan line	5.11614	1.00830	1.80878	5.02116	0.94389	1.87935	4.92928	0.88565	1.94798	4.84129	0.83137	2.01383
118	Middle of rotation	5.03523	0.00000	1.78542	4.95474	0.00000	1.85000	4.87537	0.00000	1.91369	4.79689	0.00000	1.97666
119	End of scan line	5.00607	-0.96140	1.72464	4.92129	-0.94701	1.79393	4.83778	-0.91710	1.86356	4.75656	-0.89961	1.93026
120													

~~FIG. 13A3~~ FIGS. 13A3A and 13A3B

Station 1

MR1

	A	B	C	D	E	F	G	H	I	J	K	L	M
106		Facet			Facet			Facet			Facet		
107	G3	1			2			3			4		
108	Point 1	4.36645	2.65376	0.19632	4.13039	2.57939	0.16458	3.89207	2.57127	0.13136	3.63985	2.49916	0.09731
109	Point 2	4.22328	2.62785	0.17673	3.98981	2.54937	0.14541	3.72893	2.54598	0.10897	3.48464	2.46924	0.07610
110	Point 3	4.17479	2.60928	0.16666	3.98888	2.55291	0.14522	3.69351	2.56161	0.10205	3.48464	2.46924	0.07610
111	Point 4	3.78746	2.62732	0.11577	3.58353	2.46410	0.09002	3.24144	2.51989	0.04122	3.13971	2.40274	0.02898
112	Point 5	3.59706	-1.89846	0.16625	3.42901	-1.80124	0.14108	3.10957	-1.84718	0.09716	3.03925	-1.79742	0.08649
113	Point 6	4.00140	-2.16622	0.22737	3.86105	-1.97527	0.20449	3.58373	-2.08109	0.16749	3.40752	-1.93323	0.14032
114	Point 7	4.06710	-1.99138	0.23359	3.86230	-1.97181	0.20460	3.62849	-1.96992	0.17186	3.40752	-1.93323	0.14032
115	Point 8	4.22016	-2.04815	0.25597	4.01328	-2.03180	0.22675	3.80192	-2.02808	0.19711	3.57430	-1.99474	0.16470
116	Point 9	4.36645	2.65376	0.19632	4.13039	2.57939	0.16458	3.89207	2.57127	0.13136	3.63985	2.49916	0.09731
117	Start of scan line	4.40361	1.87032	0.21487	4.17745	1.84317	0.18369	3.94222	1.82246	0.15114	3.70025	1.80404	0.11760
118	Middle of rotation	4.29870	0.23013	0.22786	4.10000	0.25000	0.20000	3.89313	0.27090	0.17070	3.67474	0.29297	0.13978
119	End of scan line	4.30920	-1.28070	0.25535	4.10701	-1.28789	0.22718	3.89234	-1.26997	0.19685	3.66999	-1.27076	0.16575
120													

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~~FIG. 13B3~~ FIGS. 13B3A and 13B3B

Station 1

MR2

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
105																			
106		Facet			Facet			Facet			Facet			Facet			Facet		
107	Q3	1			2			3			4			5			6		
108	Point 1	5.04006	0.52476	1.76314	4.94178	0.55167	1.81997	4.85731	0.53894	1.86881	4.76146	0.57105	1.92423	4.59494	0.56809	2.02051	4.42066	0.60393	2.12116
109	Point 2	4.97042	0.44428	1.88123	4.77196	0.46855	1.91816	4.67548	0.45660	1.97394	4.58109	0.48315	2.02852	4.39766	0.48153	2.13456	4.21826	0.51160	2.23831
110	Point 3	4.83173	0.66263	1.88360	4.77125	0.47110	1.91657	4.65020	0.60068	1.98856	4.58109	0.48315	2.02852	4.39672	0.48704	2.13512	4.21826	0.51160	2.23831
111	Point 4	4.32129	0.26599	2.17873	4.24022	0.20212	2.22581	4.09186	0.25949	2.31139	4.14950	0.27280	2.27807	3.77405	0.21047	2.48515	3.84486	0.34144	2.45421
112	Point 5	4.34770	-1.64845	2.16347	4.26992	-1.66717	2.20844	4.08721	-1.77102	2.31408	4.12497	-1.92124	2.29225	3.74166	-1.46848	2.51388	3.79316	-1.27109	2.48410
113	Point 6	4.77372	-2.25670	1.91714	4.71924	-2.17652	1.94864	4.56410	-2.15769	2.03834	4.49172	-2.17143	2.08019	4.30150	-1.90374	2.19018	4.13935	-1.47056	2.28393
114	Point 7	4.83579	-2.04739	1.88125	4.72049	-2.17219	1.94791	4.60668	-2.01968	2.01372	4.49172	-2.17143	2.08019	4.30312	-1.79844	2.18924	4.13935	-1.47056	2.28393
115	Point 8	4.98278	-2.13965	1.79626	4.86407	-2.27009	1.86490	4.76563	-2.11752	1.92182	4.64469	-2.27578	1.99174	4.48021	-1.90337	2.06685	4.32687	-1.57861	2.17551
116	Point 9	5.04006	0.52476	1.76314	4.94178	0.55167	1.81997	4.85731	0.53894	1.86881	4.76146	0.57105	1.92423	4.59494	0.56809	2.02051	4.42066	0.60393	2.12116
117	Start of scan line	5.02090	0.00000	1.77422	4.92826	0.00000	1.82778	4.83795	0.00000	1.88000	4.74966	0.00000	1.93105	4.57806	0.00000	2.03027	4.41147	0.00000	2.12659
118	Middle of rotation	5.02090	0.00000	1.77422	4.92826	0.00000	1.82778	4.83795	0.00000	1.88000	4.74966	0.00000	1.93105	4.57806	0.00000	2.03027	4.41147	0.00000	2.12659
119	End of scan line	5.06055	-1.14492	1.75129	4.96268	-1.22689	1.80768	4.85432	-1.09333	1.87053	4.76001	-1.19817	1.92507	4.57039	-0.89357	2.03470	4.40142	-0.84218	2.13240
120																			

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FIG. 14A1 FIGS. 14A1A and 14A1B

1

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
105																			
106	[redacted]	Facet			Facet			Facet			Facet			Facet			Facet		
107	G3	1			2			3			4			5			6		
108	Point 1	4.62498	0.44237	0.26978	4.65503	0.44811	0.22157	4.49179	0.44459	0.17770	4.30775	0.44954	0.12583	3.93952	0.44834	0.02505	3.52125	0.44891	-0.08994
109	Point 2	4.66874	0.36963	0.24652	4.50103	0.37345	0.19944	4.31949	0.37132	0.15017	4.14124	0.37427	0.10044	3.74847	0.37385	-0.00784	3.32508	0.37322	-0.12337
110	Point 3	4.62719	0.54811	0.18746	4.50022	0.37701	0.19826	4.28911	0.48536	0.11104	4.14124	0.37427	0.10044	3.74516	0.37803	-0.00933	3.32508	0.37322	-0.12337
111	Point 4	4.18842	0.22763	0.15299	4.04652	0.15472	0.13371	3.79612	0.20147	0.05234	3.78359	0.20355	0.04285	3.17535	0.15541	-0.10566	2.98199	0.24084	-0.16182
112	Point 5	4.29176	-2.24566	0.84928	4.17480	-2.32513	0.83855	3.90727	-2.24907	0.74455	3.89193	-2.41913	0.78826	3.29187	-2.00085	0.50856	3.10607	-1.64117	0.36043
113	Point 6	4.69167	-2.49257	1.02567	4.55519	-2.46863	0.99272	4.37431	-2.45821	0.92926	4.25097	-2.52955	0.91466	3.86517	-2.15830	0.70794	3.47166	-1.74831	0.48974
114	Point 7	4.74716	-2.30530	0.99034	4.59627	-2.46488	0.99200	4.41150	-2.33743	0.90686	4.25097	-2.52955	0.91466	3.86851	-2.15188	0.70712	3.47166	-1.74831	0.48974
115	Point 8	4.89443	-2.35176	1.04332	4.74089	-2.51341	1.04484	4.57811	-2.38443	0.96529	4.41114	-2.57881	0.97193	4.08339	-2.20429	0.77533	3.68342	-1.81036	0.56483
116	Point 9	4.62498	0.44237	0.26978	4.65503	0.44811	0.22157	4.49170	0.44459	0.17770	4.30775	0.44954	0.12583	3.93952	0.44834	0.02505	3.52125	0.44891	-0.08994
117	Start of scan line	4.62442	0.00000	0.38906	4.66490	0.00000	0.34528	4.50000	-0.00001	0.30000	4.32901	0.00000	0.25305	3.96553	0.00000	0.15325	3.56687	0.00000	0.04380
118	Middle of rotation	4.62442	0.00000	0.38907	4.66490	0.00000	0.34528	4.50000	0.00000	0.30000	4.32901	0.00000	0.25305	3.96553	0.00000	0.15325	3.56687	0.00000	0.04380
119	End of scan line	4.94361	-1.51167	0.82998	4.60210	-1.65315	0.82967	4.62188	-1.53817	0.74880	4.47185	-1.71403	0.75509	4.08537	-1.40033	0.56428	3.67805	-1.09574	0.37020
120																			

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~~FIG. 14B1~~ FIGS. 14B1A and 14B1B

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
106		Facet 1			Facet 2			Facet 3			Facet 4			Facet 5			Facet 6		
107	G3																		
108	Point 1	4.62496	0.44237	0.26976	4.65503	0.44811	0.22157	4.49179	0.44459	0.17770	4.30775	0.44954	0.12583	3.93952	0.44834	0.02505	3.52125	0.44891	-0.08994
109	Point 2	4.66874	0.36983	0.24652	4.50103	0.37345	0.19944	4.31949	0.37132	0.15017	4.14124	0.37427	0.10044	3.74847	0.37385	-0.00784	3.32508	0.37322	-0.12337
110	Point 3	4.62719	0.54611	0.18746	4.50022	0.37701	0.18826	4.28911	0.48536	0.11104	4.14124	0.37427	0.10044	3.74516	0.37603	-0.00933	3.32508	0.37322	-0.12337
111	Point 4	4.18842	0.22763	0.15299	4.04652	0.15472	0.13371	3.79812	0.20147	0.05234	3.76359	0.20355	0.04285	3.17535	0.15541	-0.10586	2.98199	0.24084	-0.18182
112	Point 5	4.29178	-2.24588	0.84926	4.17480	-2.32513	0.83835	3.90727	-2.24907	0.74455	3.89193	-2.41913	0.78626	3.29187	-2.00065	0.50856	3.10607	-1.84117	0.36043
113	Point 6	4.69187	-2.49257	1.02567	4.59519	-2.46863	0.99272	4.37431	-2.45821	0.92928	4.25087	-2.52955	0.91468	3.86517	-2.15630	0.70794	3.47166	-1.74831	0.48974
114	Point 7	4.74716	-2.30530	0.99034	4.59627	-2.46486	0.99200	4.41150	-2.33743	0.90866	4.25097	-2.52955	0.91468	3.86651	-2.15188	0.70712	3.47166	-1.74831	0.48974
115	Point 8	4.89443	-2.35178	1.04332	4.74099	-2.51341	1.04484	4.57811	-2.38443	0.96529	4.41114	-2.57881	0.97193	4.08339	-2.20429	0.77533	3.68342	-1.81036	0.56463
116	Point 9	4.62498	0.44237	0.26976	4.65503	0.44811	0.22157	4.49179	0.44459	0.17770	4.30775	0.44954	0.12583	3.93952	0.44834	0.02505	3.52125	0.44891	-0.08994
117	Start of scan line	4.62442	0.00000	0.38908	4.66490	0.00000	0.34528	4.50000	-0.00001	0.30000	4.32901	0.00000	0.25305	3.96553	0.00000	0.15325	3.58687	0.00000	0.04380
118	Middle of rotation	4.62442	0.00000	0.38907	4.66490	0.00000	0.34528	4.50000	0.00000	0.30000	4.32901	0.00000	0.25305	3.96553	0.00000	0.15325	3.58687	0.00000	0.04380
119	End of scan line	4.64381	-1.51167	0.82996	4.60210	-1.85515	0.82987	4.62166	-1.53817	0.74880	4.47185	-1.71403	0.75509	4.06537	-1.40033	0.56428	3.67605	-1.09574	0.37020
120																			

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~~FIG. 14C1~~ FIGS. 14C1A and 14C1B

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
106		Facet			Facet			Facet			Facet			Facet			Facet		
107	G3	1			2			3			4			5			6		
108	Point 1	4.82498	0.44237	0.26978	4.65503	0.44811	0.22157	4.49179	0.44459	0.17770	4.30775	0.44954	0.12583	3.93952	0.44834	0.02505	3.52125	0.44891	-0.06994
109	Point 2	4.66874	0.36963	0.24652	4.50103	0.37345	0.19944	4.31949	0.37132	0.15017	4.14124	0.37427	0.10044	3.74647	0.37385	-0.00784	3.32508	0.37322	-0.12337
110	Point 3	4.62719	0.34611	0.18746	4.50022	0.37701	0.19826	4.26911	0.48536	0.11104	4.14124	0.37427	0.10044	3.74516	0.37803	-0.00933	3.32508	0.37322	-0.12337
111	Point 4	4.18842	0.22763	0.15299	4.04652	0.15472	0.13371	3.79612	0.20147	0.05234	3.76359	0.20355	0.04285	3.17533	0.15541	-0.10566	2.98199	0.24084	-0.18182
112	Point 5	4.29178	-2.24588	0.84926	4.17480	-2.32513	0.83855	3.90727	-2.24907	0.74455	3.89193	-2.41913	0.78826	3.29187	-2.00085	0.50856	3.10607	-1.84117	0.36043
113	Point 6	4.69167	-2.49257	1.02567	4.59519	-2.46863	0.99272	4.37431	-2.45821	0.92926	4.25097	-2.52955	0.91466	3.86517	-2.15630	0.70794	3.47166	-1.74831	0.48974
114	Point 7	4.74718	-2.30530	0.99034	4.59627	-2.46486	0.99200	4.41150	-2.33743	0.90686	4.25097	-2.52955	0.91466	3.86651	-2.15186	0.70712	3.47166	-1.74831	0.48974
115	Point 8	4.89443	-2.35176	1.04032	4.74099	-2.51341	1.04484	4.57811	-2.38443	0.96529	4.41114	-2.57881	0.97199	4.09339	-2.20429	0.77533	3.68342	-1.81036	0.56483
116	Point 9	4.82498	0.44237	0.26978	4.65503	0.44811	0.22157	4.49179	0.44459	0.17770	4.30775	0.44954	0.12583	3.93952	0.44834	0.02505	3.52125	0.44891	-0.06994
117	Start of scan line	4.62442	0.00000	0.38908	4.66490	0.00000	0.34528	4.50000	-0.00001	0.30000	4.32901	0.00000	0.25305	3.96553	0.00000	0.15325	3.56687	0.00000	0.04380
118	Middle of rotation	4.82442	0.00000	0.38907	4.66480	0.00000	0.34528	4.50000	0.00000	0.30000	4.32901	0.00000	0.25305	3.96553	0.00000	0.15325	3.56687	0.00000	0.04380
119	End of scan line	4.84361	-1.51167	0.82998	4.80210	-1.65515	0.82987	4.62188	-1.53817	0.74880	4.47185	-1.71403	0.75509	4.08537	-1.40033	0.56428	3.67805	-1.09574	0.37020
120																			

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~~FIG. 14D1~~ FIGS. 14D1A and 14D1B

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
106		Facet			Facet			Facet			Facet			Facet			Facet		
107	G3	1			2			3			4			5			6		
108	Point 1	7.38483	0.36821	3.60327	7.31635	0.35437	3.61936	7.25212	0.36293	4.03445	7.17887	0.35054	4.26573	7.03506	0.35981	4.74102	6.87159	0.34512	5.26544
109	Point 2	7.33669	0.30677	3.72290	7.27018	0.29548	3.93288	7.20014	0.30320	4.16842	7.13030	0.29192	4.39726	6.97894	0.30016	4.88659	6.81701	0.28708	5.40695
110	Point 3	7.35085	0.45214	3.76848	7.27046	0.29830	3.93374	7.20860	0.39665	4.19784	7.13030	0.29192	4.39726	6.97921	0.30354	4.88784	6.81701	0.28708	5.40695
111	Point 4	7.19969	0.19069	4.09695	7.13404	0.12287	4.26827	7.04932	0.18475	4.57132	7.02005	0.15884	4.66313	6.81268	0.12498	5.31804	6.72143	0.18544	5.65479
112	Point 5	6.76158	-2.71194	3.63300	6.69289	-2.84072	3.83654	6.61109	-2.72069	4.17939	6.55131	-2.93734	4.23771	6.36745	-2.80040	4.92441	6.22148	-3.06048	5.23666
113	Point 6	6.82335	-2.91744	3.36218	6.76969	-2.95787	3.51184	6.69286	-2.89597	3.80174	6.61899	-3.02659	3.96692	6.47684	-2.92071	4.49198	6.28421	-3.12902	4.98656
114	Point 7	6.89196	-2.76529	3.33225	6.77043	-2.95483	3.51128	6.71618	-2.78911	3.78090	6.61699	-3.02659	3.96692	6.47758	-2.91719	4.49112	6.28421	-3.12902	4.98656
115	Point 8	6.89054	-2.80469	3.21407	6.79682	-2.99436	3.40022	6.75093	-2.83803	3.64675	6.64613	-3.06818	3.84879	6.51493	-2.95743	4.34377	6.32024	-3.16838	4.84819
116	Point 9	7.38483	0.36821	3.60327	7.31635	0.35437	3.61936	7.25212	0.36293	4.03445	7.17887	0.35054	4.26573	7.03506	0.35981	4.74102	6.87159	0.34512	5.26544
117	Start of scan line	7.32381	0.00361	3.57345	7.25890	0.00058	3.78342	7.19246	0.00004	4.00001	7.12389	-0.00002	4.22381	6.97902	0.00007	4.69680	6.82144	0.00006	5.21121
118	Middle of rotation	7.32325	0.00000	3.57301	7.25862	0.00000	3.78335	7.19245	0.00000	4.00000	7.12389	0.00000	4.22382	6.97901	0.00000	4.69679	6.82143	0.00000	5.21120
119	End of scan line	7.01771	-2.11473	3.23472	6.92439	-2.31840	3.41071	6.87655	-2.14504	3.66967	6.77390	-2.39464	3.85384	6.84348	-2.26783	4.35990	6.44631	-2.50435	4.84743
120																			

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~~FIG. 15A3~~ FIGS. 15A3A and 15A3B

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
106		Facet			Facet			Facet			Facet			Facet			Facet		
107	G3	1			2			3			4			5			6		
108	Point 1	7.38483	0.36621	3.60327	7.31635	0.35437	3.81936	7.25212	0.36293	4.03445	7.17887	0.35054	4.26573	7.03506	0.35981	4.74102	6.87159	0.34512	5.26544
109	Point 2	7.33689	0.30877	3.72290	7.27018	0.29548	3.93269	7.20014	0.30320	4.16642	7.13030	0.29192	4.38726	6.97894	0.30016	4.88658	6.81701	0.28706	5.40695
110	Point 3	7.35085	0.45214	3.76948	7.27046	0.29830	3.93374	7.20860	0.39685	4.19794	7.13030	0.29192	4.38726	6.97921	0.30354	4.88784	6.81701	0.28708	5.40695
111	Point 4	7.19969	0.19089	4.09695	7.13404	0.12267	4.26827	7.04932	0.16475	4.57132	7.02005	0.15884	4.66313	6.81288	0.12498	5.31804	6.72143	0.16544	5.65479
112	Point 5	6.76168	-2.71194	3.69330	6.69269	-2.84072	3.83654	6.61109	-2.72069	4.17839	6.55131	-2.93734	4.23771	6.36745	-2.80040	4.92441	6.22148	-3.06048	5.23666
113	Point 6	6.82335	-2.91744	3.36219	6.76969	-2.95787	3.51184	6.69266	-2.89597	3.80174	6.61699	-3.02659	3.96692	6.47684	-2.92071	4.49186	6.28421	-3.12902	4.98858
114	Point 7	6.86196	-2.76529	3.33225	6.77043	-2.95493	3.51128	6.71818	-2.78811	3.78090	6.61699	-3.02659	3.96692	6.47758	-2.91719	4.48112	6.28421	-3.12902	4.98858
115	Point 8	6.89054	-2.60469	3.21407	6.79682	-2.99436	3.40022	6.75093	-2.83803	3.64875	6.64613	-3.09618	3.84979	6.51493	-2.93743	4.34377	6.32024	-3.16838	4.84610
116	Point 9	7.38483	0.36621	3.60327	7.31635	0.35437	3.81936	7.25212	0.36293	4.03445	7.17887	0.35054	4.26573	7.03506	0.35981	4.74102	6.87159	0.34512	5.26544
117	Start of scan line	7.32381	0.00361	3.57343	7.25890	0.00056	3.78342	7.19246	0.00004	4.00001	7.12389	-0.00002	4.22381	6.97902	0.00007	4.69680	6.82144	0.00008	5.21121
118	Middle of rotation	7.32325	0.00000	3.57301	7.25882	0.00000	3.78335	7.19245	0.00000	4.00000	7.12389	0.00000	4.22382	6.97901	0.00000	4.69679	6.82143	0.00000	5.21120
119	End of scan line	7.01771	-2.11473	3.23472	6.92439	-2.31840	3.41071	6.87855	-2.14504	3.66987	6.77390	-2.39484	3.85384	6.64348	-2.26763	4.35990	6.44831	-2.50435	4.84743
120																			

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~~FIG. 15B3~~ FIGS. 15B3A and 15B3B

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
106		Facet			Facet			Facet			Facet			Facet			Facet		
107	G3	1			2			3			4			5			6		
108	Point 1	7.38483	0.36621	3.60327	7.31635	0.35437	3.81936	7.25212	0.36293	4.03445	7.17887	0.35054	4.26573	7.03506	0.35961	4.74102	6.87159	0.34512	5.26544
109	Point 2	7.33669	0.30677	3.72290	7.27019	0.29548	3.93289	7.20014	0.30320	4.16542	7.13000	0.29192	4.38726	6.97894	0.30016	4.68659	6.81701	0.28708	5.40695
110	Point 3	7.35085	0.45214	3.76648	7.27048	0.29830	3.93374	7.20660	0.39685	4.19794	7.13030	0.29192	4.38726	6.97821	0.30354	4.68784	6.81701	0.28708	5.40695
111	Point 4	7.19969	0.19089	4.09695	7.13404	0.12287	4.26827	7.04932	0.16475	4.57132	7.02005	0.15884	4.66313	6.81288	0.12498	5.31804	6.72143	0.18544	5.65479
112	Point 5	6.76168	-2.71194	3.89330	6.69269	-2.84072	3.63654	6.61109	-2.72069	4.17939	6.55131	-2.83734	4.23771	6.36745	-2.80040	4.92441	6.22148	-3.06048	5.23686
113	Point 6	6.82335	-2.91744	3.36219	6.76968	-2.95787	3.51184	6.69266	-2.89597	3.80174	6.61699	-3.02659	3.96692	6.47758	-2.91719	4.49112	6.28421	-3.12902	4.96856
114	Point 7	6.86196	-2.78529	3.33225	6.77043	-2.95493	3.51128	6.71616	-2.78611	3.78090	6.64613	-3.06616	3.84679	6.51493	-2.95743	4.34377	6.32024	-3.16838	4.84610
115	Point 8	6.89054	-2.80469	3.21407	6.79682	-2.99436	3.40022	6.75093	-2.83803	3.64675	6.64613	-3.06616	3.84679	7.03506	0.35961	4.74102	6.87159	0.34512	5.26544
116	Point 9	7.38483	0.36621	3.60327	7.31635	0.35437	3.81936	7.25212	0.36293	4.03445	7.17887	0.35054	4.26573	6.97902	0.00007	4.69680	6.82144	0.00008	5.21121
117	Start of scan line	7.32381	0.00361	3.57345	7.25690	0.00056	3.76342	7.19246	0.00004	4.00001	7.12389	-0.00002	4.22381	6.97901	0.00000	4.69679	6.82143	0.00000	5.21120
118	Middle of rotation	7.32325	0.00000	3.57301	7.25682	0.00000	3.76335	7.19245	0.00000	4.00000	7.12389	0.00000	4.22382	6.97901	0.00000	4.69679	6.82143	0.00000	5.21120
119	End of scan line	7.01771	-2.11473	3.23472	6.82439	-2.31840	3.41071	6.67655	-2.14504	3.66967	6.77390	-2.39484	3.85384	6.64348	-2.26783	4.35990	6.44831	-2.50435	4.84743
120																			

~~FIG. 15C3~~ FIGS. 15C3A and 15C3B

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	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
106	[redacted]	Facet			Facet			Facet			Facet			Facet			Facet		
107	G3	1			2			3			4			5			6		
108	Point 1	7.38483	0.36821	3.60327	7.31635	0.35437	3.81936	7.25212	0.36293	4.03445	7.17887	0.35054	4.26573	7.03508	0.35981	4.74102	6.87159	0.34512	5.26544
109	Point 2	7.33669	0.30677	3.72290	7.27018	0.29548	3.93269	7.20014	0.30320	4.16642	7.13030	0.29192	4.38726	6.97894	0.30016	4.88659	6.81701	0.28708	5.40695
110	Point 3	7.35065	0.45214	3.76848	7.27048	0.29830	3.93374	7.20660	0.39685	4.19784	7.13030	0.29192	4.38726	6.97921	0.30354	4.88784	6.81701	0.28708	5.40695
111	Point 4	7.19969	0.19089	4.09695	7.13404	0.12787	4.26827	7.04932	0.16475	4.57132	7.02005	0.13584	4.66313	6.81286	0.12498	5.31604	6.72143	0.18544	5.65479
112	Point 5	6.78168	-2.71194	3.69330	6.69269	-2.64072	3.83654	6.61109	-2.72069	4.17939	6.58131	-2.93734	4.23771	6.36745	-2.80040	4.92441	6.22148	-3.09048	5.23686
113	Point 6	6.82335	-2.91744	3.36219	6.76969	-2.95787	3.61184	6.69286	-2.89587	3.80174	6.61699	-3.02659	3.96892	6.47664	-2.92071	4.49186	6.28421	-3.12902	4.96858
114	Point 7	6.66196	-2.76529	3.33225	6.77043	-2.95493	3.51128	6.71816	-2.78611	3.78090	6.61699	-3.02659	3.96892	6.47758	-2.91719	4.49112	6.28421	-3.12902	4.96858
115	Point 8	6.69054	-2.80469	3.21407	6.79662	-2.99436	3.40022	6.75093	-2.83600	3.64875	6.64613	-3.06618	3.84678	6.51493	-2.95743	4.34377	6.32024	-3.16838	4.84810
116	Point 9	7.38483	0.36821	3.60327	7.31635	0.35437	3.81936	7.25212	0.36293	4.03445	7.17887	0.35054	4.26573	7.03508	0.35981	4.74102	6.87159	0.34512	5.26544
117	Start of scan line	7.32381	0.00361	3.57345	7.25690	0.00056	3.78042	7.19246	0.00004	4.00001	7.12389	-0.00002	4.22381	6.97902	0.00007	4.69680	6.82144	0.00006	5.21121
118	Middle of rotation	7.32325	0.00000	3.57301	7.25682	0.00000	3.78335	7.19245	0.00000	4.00000	7.12389	0.00000	4.22382	6.97901	0.00000	4.69679	6.82143	0.00000	5.21120
119	End of scan line	7.01771	-2.11473	3.23472	6.92439	-2.31840	3.41071	6.87855	-2.14504	3.86967	6.77390	-2.39464	3.85384	6.64346	-2.26763	4.35990	6.44831	-2.50435	4.84743

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~~FIG. 15D3~~ FIGS. 15D3A and 15D3B